Alg. 2 Warm Up #4-4

1. $f(x) = (4x - 5)(4x - 7)$

a. Which point(s) are easiest to find from factored form?
(x- intercepts, y- intercept, or vertex)

b. Find all the special points.

2. Quick graphs: (No grapher)

a) $y = \frac{4}{5}x - 3$

b) $5x - 2y = 10$

HW Questions:

6a) $216^{1/3}$

$\cancel{\sqrt[3]{}}(6)^{\cancel{3}}$

6

b) $125^{4/3}$

$\left(\sqrt[3]{125}\right)^4$

5^4

$\boxed{625}$

$3^3 = 27$

$\boxed{5^3 = 125}$

$6^3 = 216$

7) $\left(\sqrt[3]{17}\right)^x$

$\left(17^{1/3}\right)^x$

$\frac{1}{3} \cdot \frac{x}{1}$

$17^{x/3}$

1) a

n	1	2	3
$t(n)$	3	6	12

$\times 2$ $\times 2$

b)

n	1	2	3	4
$t(n)$	-7	-3	1	5

5)

t	
0	80,000
1	32,000
2	12,800

$0.40(80,000)$

$a = 80,000$

$100\% - 60\% = 40\%$

$V(t) = 80,000(0.4)^t \quad b = 0.4$

8b) 7.68 E-6

Means 7.68×10^{-6}

0.00000768

$(2, 75)$ $(3, 375)$

$y = ab^x$

$75 = ab^2$

$75 = a(5)^2$

$a = 3$

$\frac{375}{75} = \frac{\cancel{a}b^3}{\cancel{a}b^2}$

$5 = b$

3) a

0	1	2	3
2	6	18	54

$\div 3$ $\times 3$ $\times 3$

common multiplier $= 3$

b) $t(n) = 2(3)^n$

c) $t(12) = 2(3)^{12}$

$= 1,062,882$

8b) $y = 3(5)^x$

$= 3(5)^{-8}$

CHAPTER 2 Transformations of Parent Graphs

In the first section of Chapter 2, you will learn how to change the equation of a parabola to make it fit a set of nonlinear data. After you learn how to stretch, compress, reflect, and shift the graph of $f(x)=x^2$, you will be able to create a variety of parabolic shapes and sizes.

You will learn that a graph's transformations are clearly recognizable when its equation is written in graphing form. Understanding this form will help you learn how to rewrite equations so that they are easier to graph. You will also use the quadratic family of functions to model physical situations, such as the arc of a jumping rabbit and the path of a soccer ball.

In Section 2.2, you will apply these same types of transformations to other parent functions.

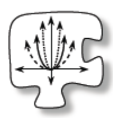
Guiding Question

Mathematically proficient students model with mathematics.

As you work through this chapter, ask yourself:

How can I model this everyday situation with mathematics?

Chapter Outline

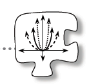


Section 2.1 In this section, you will learn how to shift, stretch, compress, and flip the graph of $f(x)=x^2$. You will write a general equation for the family of quadratic functions. Then you will learn how to graph a quadratic function quickly when it is written in graphing form. You will model physical situations with quadratic functions.

Section 2.2 You will apply the concepts of transformation to other parent functions, and you will learn that transforming each parent function creates a whole family of functions. You will write a general equation for a family of functions. You will learn how the equation predicts the geometric transformations made to the graph of a function.

CP's: 2- # 1 ---> 2

2.1.1 How can an equation help me predict?



Modeling Non-Linear Data

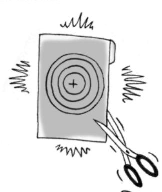
This chapter will help you develop the power to manipulate functions so that they are useful in a wide variety of situations. Today's lesson focuses on collecting data and finding a function to model the trend in that data. You will then generalize your results and make predictions beyond the range of data you can measure. Discuss the following focus questions with your team while you work:

What will the graph look like?

Should we connect the data points?

How can we find an equation that fits the data?

2-1. SHRINKING TARGETS LAB



What is the relationship between the radius of a disk and its mass? If you double the radius of the disk, does the mass also double?

To answer these questions, your team will use scissors, a scale, and a Lesson 2.1.1 Resource Page. You will measure the weight of at least 8 different circular disks of varying radii (the plural of "radius"). Find your first data point by cutting out the large circle, measuring its radius, and using the scale to weigh it carefully. Repeat this process for circles of different radii.

After your team has collected its data, answer the questions below.

a. Look at your data with your team and predict what you think the graph will look like. Justify your prediction.

b. Enter your data in the graphing calculator and plot it. Sketch the graph of your data on your paper.

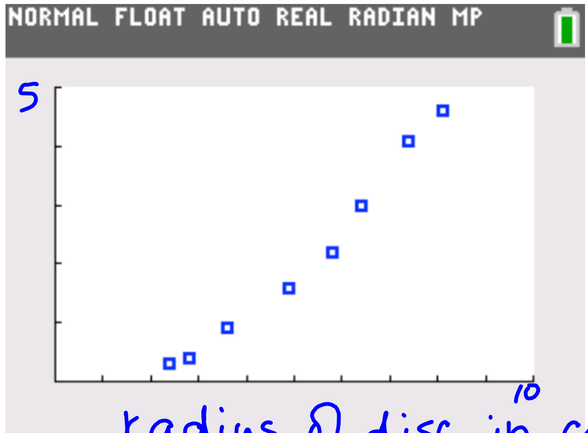
c. Consider the shrinking targets situation, what do you predict the x- and y-intercepts should be? What do they represent? Does the graph of your equation have these same intercept(s)? If not, explain completely why not.

d. What kind of equation do you think will model your data? Will your model predict the intercepts correctly?

e. Work with your team to find an equation that fits your data. Test the accuracy of your team's equation by entering it into your graphing calculator. If necessary, adjust your equation to make its graph fit your data and the x- and y-intercepts better. Once you are satisfied with your model, sketch the graph of your equation on your graph of data points from part (b).

f. What would be the mass of a target with a radius twice as large as the largest one you measured? How do you know?

Weight
Mass
in
grams



radius of disc in cm

x & y intercepts

(0,0) → when r=0, we have no mass

2-2. What more can be said about the equation you used to model your data from the Shrinking Targets Lab? Consider this as you answer the questions below.

a. What are all of the acceptable input and output values (domain and range) for the activity in Shrinking Targets Lab? Do they match the domain and range of the function you used to model your data? If not, why are they different?

b. In part (a), you may have noticed that your equation only makes sense as a model for your data for part of its domain. Therefore, to accurately describe your model, you can add a condition to your equation, such as, "This equation is a good model when __________."

What condition can you add to describe when your model is valid?

HW: 2- # 4 ---> 10

and work on green
classwork